1.Find the mean of the distribution:
$130,90,25,77,250,100$
A. 25
B. 77
C. 100
D. 112

Ans: D
Sol:
$130+90+25+77+250+100=672$
$\therefore$ Mean $=672 / 6=112$
Hence, option D is the correct answer.
2.Find the mode of the following data:110, $80,70,90,120,90,80,70,60,80$
A. 80
B. 110
C. 90
D. 120

## Ans: A

## Sol:

Mode of a set is the number with the highest frequency.
In the given data, number 80 the most repetitive number.
Hence, option A is the correct answer.
3.If the mean height of 12 men is 1.70 m and the mean height of 8 women is 1.60 m , then the total height of 8 women in meters is:
A. 12.9
B. 12.8
C. 12.4
D. 13

Ans: B
Sol:
Since, mean height of 8 women is 1.60 m
$\therefore$ Total height of 8 women will be
$8 \times 1.60=12.8 \mathrm{~m}$
Hence, option B is the correct answer.
4.If the standard deviation of a population is 4.5. What is its variance?
(A) 20.25
(B) 20
(C) 9
(D) 18
A. (D)
B. (C)
C. (B)
D. (A)

Ans: D
Sol:
Variance $=(4.5)^{2}=20.25$
5.The temperature recorded for a particular week is given below:

| Days of week | Temperature in Celsium |
| :---: | :---: |
| Sunday | 28 |
| Monday | 32 |
| Tuesday | 35 |
| Wednesday | 30 |
| Thursday | 31 |
| Friday | 29 |
| Saturday | 29 |

What was the average temperature for the week in degree C ?
(A) 29
(B) 30.5
(C) 31.5
(D) 32
A. (A)
B. (D)
C. (C)
D. (B)

Ans: D

## Sol:

Average temperature of the week in degree
$\mathrm{C}=\frac{28+32+35+30+31+29+29}{7}=30.5$

EXAM PREP
6.The average weight of 19 students is 15 kg . By the admission of a new student the average weight is reduced to 14.8 kg . The weight of new student is :
A. 10.6 kg
B. 10.8 kg
C. 11 kg
D. 14.9 kg

Ans: C
Sol: Given: Average of 19 students $=15$
Total weight of all 19 students = $19 \times 15=285 \mathrm{~kg}$
After admission of a new student average becomes 14.8 now,
Total weight of 20 students $=20 \times 14.8=296$ kg
Hence, weight of a new student= 296$285=11 \mathrm{~kg}$
7.The average of marks of 14 students calculated as 71 . But it was later found that the marks of one student had been wrongly entered as 42 instead of 56 and of another as 74 instead of 32 . The correct average is
A. 67
B. 68
C. 69
D. 71

Ans: C
Sol: Marks obtained by 14 students=14 $\times 71=994$
Exact marks of 14 students $=994+[(56-$ 42) $+(32-74)]=966$

Correct average $=966 / 14=69$
8.Speed of a boat in still water is 12 kmph and that of the current is 3 kmph . A man rows a boat upstream up to 135 km and returns downstream to the starting point. Find the total time taken for the entire journey in hours?
A. 24
B. 48
C. 36
D. 30

Ans: A
Sol: Speed of boat in still water $(\mathrm{x})=12$ kmph
Speed of current (y) $=3 \mathrm{kmph}$
Speed of boat during upstream ( $\mathrm{x}-\mathrm{y}$ ) $=12$ $3=9 \mathrm{kmph}$
Speed of boat during downstream $(\mathrm{x}+\mathrm{y})=$ $12+3=15 \mathrm{kmph}$
A man rows a boat upstream up to 135 km and returns downstream to the starting point.
Required Time $=$

$$
\frac{135}{9}+\frac{135}{15}=15+9=24 \mathrm{kmph}
$$

9.A man can row $12 \mathrm{~km} /$ hour in still water, when the river is running @ $3 \mathrm{~km} / \mathrm{hour}$, it takes him 1 hour to row to a place and to come back. How far is the place (in KM)?
A. $45 / 8$
B. $45 / 4$
C. $25 / 8$
D. 15

Ans: A
Sol:
Let the distance is d .

$$
\begin{aligned}
& \frac{d}{12+3}+\frac{d}{12-3}=1 \\
& \frac{d}{15}+\frac{d}{9}=1 \\
& \frac{8 d}{45}=1 \\
& 8 \mathrm{~d}=45 \\
& d=45 / 8 \mathrm{Km}
\end{aligned}
$$

10.Points A, B and C are situated at the bank of a river, which is flowing at a constant rate. B is at an equal distance with A and C, a swimmer Raj takes 10 hours to swim from A to B , and B to A . also he takes 4 hours to swim from A to C. what is the ratio of speed of Raj in still water and speed of stream?

A. 5:3
B. $4: 3$
C. 6:5
D. 7: 2

Ans: A

## Sol:


$\mathrm{AB}=\mathrm{AC}$
$(\mathrm{A}$ to B$)(\mathrm{B}$ to C$)=10 \mathrm{hr}$
$($ A to B$)=\frac{4}{2}=2 h r$
$(B$ to $A)=10-2)=8 \mathrm{hr}$
$\frac{x+y}{x-y}=\frac{8}{2}$
$X+y=4 x-4 y$
$5 y=3 x$
$\frac{x}{y}=\frac{5}{3} \Rightarrow 5: 3$
11.A river 3 m deep and 40 m wide is flowing at the rate of $2 \mathrm{~km} / \mathrm{h}$. How much water (in litres) will fall into the sea in 1 minute?
A. 400000
B. 4000000
C. 40000
D. 4000

Ans: B
Sol: Speed of the current $=2 \mathrm{~km} / \mathrm{h}=10 / 18$ $\mathrm{m} / \mathrm{sec}$
Cross sectional area $=3 \times 40=120 \mathrm{~m}^{2}$

Volume flow rate $=10 / 18 \times 120=400 / 6$ $=200 / 3$ cu.metre per second
1 cu . Metre $=1000$ litre
200 cu.metre $=200000$ litre
Flow in 1 second $=200000 / 3$ litre
Flow in 60 second $=200000 / 3 \times 60=$ 4000000 litre
12.There is a $40 \%$ increase in an amount in 4 years at simple interest. What will be the compound interest on Rs. 6000 after 3 years at the same rate?
A. Rs. 1260
B. Rs. 1986
C. Rs. 19860
D. Rs. 7986

Ans: B
Sol:
Let principal $=\mathrm{P}$ unit
Simple interest for 4 years $=\frac{40 P}{100}=\frac{2}{5} P$
We know that,
Simple Interest $=\frac{\text { Principal } \times \text { rate } \times \text { time }}{100}$
$\Rightarrow \frac{2}{5} P=\frac{P \times R \times 4}{100}$
$\Rightarrow R=\frac{200}{20}=10 \%$
Now, we have to find compound interest on Rs. 6000 after 3 years at $5 \%$.
Amount $=$ Principal $\left(1+\frac{\text { Rate }}{100}\right)^{3}$
Amount $=6000\left(1+\frac{10}{100}\right)^{3}=6000 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}=$ Rs. 7986
Hence, Required Compound Interest = Rs.
7986 - Rs. 6000 = Rs. 1986
13.A certain sum amounts to Rs 7200 in 2 years at $20 \%$ per annum compound interest, compounded annually. Find the sum?
A. Rs. 4800
B. Rs. 6000
C. Rs. 5400
D. Rs. 5000

Ans: D

## Sol:

Amount $=$ Rs. 7200
Rate $=20 \%$
Time $=2$ years
According to question

$$
\begin{aligned}
& \text { Amount }=\mathrm{P}\left(1+\frac{R}{100}\right)^{T} \\
\Rightarrow & 7200=P\left(1+\frac{20}{100}\right)^{2} \\
\Rightarrow & 7200=P\left(1+\frac{1}{5}\right)^{2}=P\left(\frac{6}{5}\right)^{2} \\
\Rightarrow & P=7200 \times \frac{5}{6} \times \frac{5}{6}=\text { Rs. } 5000
\end{aligned}
$$

14.Mr. Sathya invested money in FD. How much will he get on maturity, if Rs. 14,500 is invested at $20 \%$ per annum compound interest for 6 months, compounded quarterly?
A. Rs. 15,986.25
B. Rs. $15,986.5$
C. Rs. 15,986.35
D. Rs. 15,986

Ans: A

## Sol:

Principal = Rs. 14500
Rate $=20 \%$
Time $=6$ months
For quarterly compounded,
Amount
$14500\left(1+\frac{\frac{20}{4}}{100}\right)^{2}=14500\left(1+\frac{1}{20}\right)^{2}=14500 \times \frac{21}{20} \times \frac{21}{20}=$ Rs. 15986.25
Hence, he will get Rs. 15986.25 on maturity.
15.K borrowed Rs. $P$ at a compound interest of $20 \%$ p.a. for 2 years. Interest amount payable was Rs. 5,280. What was the value of P ?
A. Rs. 12,000
B. Rs. 11,000
C. Rs. 11,750
D. Rs. 12,500

Ans: A
Sol: K borrowed Rs. P at a compound interest of $20 \%$ p.a. for 2 years.
Interest amount payable was Rs. 5,280.

$$
\begin{aligned}
& P\left(1+\frac{20}{100}\right)^{2}=P+5280 \\
\Rightarrow & P \times \frac{6}{5} \times \frac{6}{5}=P+5280 \\
\Rightarrow & \frac{36}{25} P=P+5280 \\
\Rightarrow & \frac{11}{25} P=5280 \\
\Rightarrow & P=5280 \times \frac{25}{11}=\text { Rs. } 12000
\end{aligned}
$$

16.Find the fourth proportional to $2,3,6$ ?
A. 9
B. 10
C. 7
D. 8

Ans: A
Sol:
Let the fourth proportional be $x$.
Then, $2: 3=6: x$
$\mathrm{x}=(6 \times 3) / 2=9$
Hence, option A is the correct answer.
17.Mr. Prabhat borrowed Rs. 8000 at 5\% per annum compound interest. The compound interest compounded annually for 2 years is :
(A) Rs. 820
(B) Rs. 8820
(C) Rs. 8802
(D) Rs. 802
A. (B)
B. (D)
C. (C)
D. (A)

Ans: D

## Sol:

Principal=P=8000 Rs.
Interest rate $=\mathrm{r}=5 \%$ p.a.
Time=t=2 year

EXAM PREP

Compound interest=
$8000 \times\left(\frac{105}{100}\right)^{2}-8000=8820-8000=820$ Rs.
18.The difference between simple interest and compound interest on a certain sum of money at $5 \%$ per annum for 3 years is Rs. 14.48 . Find the principle. (Rounded off)
(A) Rs. 1850
(B) Rs. 1999
(C) Rs. 1899
(D) Rs. 2160
A. (A)
B. (D)
C. (C)
D. (B)

Ans: C
Sol:
Let the principal be P
Simple interest for 3 years at 5\%per annum $=\mathrm{P} * 5 * 3 / 100=15 \mathrm{P} / 100$

Compound interest for 3 years at 5\% per annum $=P(1+5 / 100)^{3}-\mathrm{P}=1261 \mathrm{P} / 8000$

Difference between CI and SI = $1261 \mathrm{P} / 8000-15 \mathrm{P} / 100=61 \mathrm{P} / 8000=14.48$
$61 \mathrm{P} / 8000=14.48$
$P=14.48 * 8000 / 61=$ Rs. 1899
19.R borrowed 1200 at $13 \%$ per annum simple interest. What amount will R pay to clear the debt after 5 years?
(A) 1860
(B) 1880
(C) 1980
(D) 2000
A. (A)
B. (B)
C. (C)
D. (D)

Ans: C

Sol: S.I $=(\operatorname{PxRxT}) / 100$
(1200x13x5)/100
$=780$
Amount after 5 years $=1200+780=1980$
20.Mr. Vinod borrowed Rs. 9000 at 5\% per annum compound interest. The compound interest compounded annually for 2 years is:
A. Rs. 922.5
B. Rs. 9921.5
C. Rs. 921.5
D. Rs. 9922.5

Ans: A

## Sol:

Principal = Rs. 9000
Rate $=5 \%$
Time $=2$ years
Amount =
$9000\left(1+\frac{5}{100}\right)^{2}=9000 \times \frac{105}{100} \times \frac{105}{100}=$ Rs. 9922.5
Compound Interest = Rs. 9922.5 - Rs. 9000 $=922.5$
21.A sum of money invested at compound interest amounts in 3 years to Rs. 9,600 and in 4 years to Rs. 10,080. The interest rate per annum is:
(A) $18 \%$ (B) $5 \%$
(C) $10 \%$ (D) $12 \%$
A. C
B. A
C. D
D. B

Ans: D

## Sol:

Let the rate of interest be $\mathrm{r} \%$.
$\frac{10080}{9600}=\frac{\left(1+\frac{r}{100}\right)^{4}}{\left(1+\frac{r}{100}\right)^{3}}$
$\Rightarrow 21 / 20=1+\mathrm{r} / 100$
$\Rightarrow 1+1 / 20=1+\mathrm{r} / 100$
$\Rightarrow r=5 \%$
22. What number should be deducted from 1265 to make it exactly divisible by 29 ?
A. 18
B. 17
C. 16
D. 15

Ans: A

## Sol:

We can write $1265=43 \times 29+18$
So make the number divisible by 29 we have to subtract 18
23.A number is divided by 627 then 43 is remainder. If the number is divided by 19 then what will be the remainder?
(A) 5
(B) 18
(C) 13
(D) 7
A. (D)
B. (C)
C. (B)
D. (A)

Ans: D

## Sol:

Let number be the x .
We know that, dividend $=$ divisor $\times$ quotient + remainder When $x$ is divided by 627 , the remainder is 43.
$x=627 k+43$, where $k$ is quotient.
Here $x$ is multiple of 627.
Let us consider the factor s of 627, $627=3 \times 19 \times 11$
We have to find the remainder when dividing by 19 so expressing the equation in term of 19 is helpful.
As $43=19 \times 2+5$
Therefore
$x=3 \times 19 \times 11 \times k+(19 \times 2+5)=19(33 k+2)+5$
$x=19(33 k+2)+5$
So, on dividing x by 19 the remainder will be 5 .
24.The LCM of two numbers is 40 times its HCF. If the product of the numbers is 1440 , find their HCF.
A. 6
B. 12
C. 15
D. 8

Ans: A

## Sol:

The LCM of two numbers is 40 times its HCF.
$\mathrm{LCM}=40 \times H C F$
We know that, $L C M \times H C F=1440$
$\Rightarrow 40 \times H C F \times H C F=1440$
$\Rightarrow(H C F)^{2}=36$
$\Rightarrow H C F=6$
25.Two numbers are in ratio $3: 8$ and their HCF is 7 . Their LCM is:
A. 186
B. 56
C. 21
D. 168

Ans: D
Sol:
Let the numbers are $3 x$ and $8 x$.
HCF of $3 x$ and $8 x$ is $x$.
$\therefore \mathrm{x}=7$
$\therefore$ Numbers are $3 \times 7=21$ and $8 \times 7=56$
Now,
LCM of $(21,56)=168$
Hence, option D is the correct answer.
26.Find the LCM of 24, 96 and 36
A. 576
B. 216
C. 288
D. 144


Ans: C

## Sol:

Consider LCM of 24, 96 and 36 .
$24=2^{3} \times 3$
$96=2^{5} \times 3$
$36=2^{2} \times 3^{2}$
$\operatorname{LCM}(24,96,36)=2^{5} \times 3^{2}=288$
27.Find the HCF of 143,77 and 121
A. 6
B. 11
C. 4
D. 7

Ans: B

## Sol:

HCF of 143,77 and 121.
$143=11 \times 13 ; 77=11 \times 7 ; 121=11 \times 11$
Hence, HCF of 143,77 and $121=11$
28.Find the LCM of given data-
$\frac{2}{3}, \frac{8}{9}, \frac{1}{27}, \frac{32}{81}$
(A) $32 / 81$ (B) $81 / 32$
(C) $32 / 3$ (D) $11 / 41$
A. (D)
B. (A)
C. (C)
D. (B)

Ans: C
Sol: LCM of fractions $=$ (LCM of Numerator)/(HCF of denominator)

Hence the LCM of the given fractions $=$ (LCM of $2,8,1,32) /($ HCF of $3,9,27,81)$
$\mathrm{LCM}=32 / 3$
29.If p and q are in the ratio $4: 3$ and their LCM is $36, p+q=$ ?
A. 18
B. 21
C. 24
D. 12

Ans: B

Sol: p and q are in the ratio $4: 3$
$\Rightarrow \mathrm{p}=4 \mathrm{k}$
$\Rightarrow \mathrm{q}=3 \mathrm{k}$
$\operatorname{LCM}(p, q)=(4 \mathrm{k}, 3 \mathrm{k})=12 \mathrm{k}$
According to question
$\Rightarrow 12 \mathrm{k}=36$
$\Rightarrow \mathrm{k}=3$
hence, $\mathrm{p}=12$
$\mathrm{q}=9$
$\Rightarrow p+q=12+9=21$
30.There is $6 \%$ of sugar in a 5 litre mixture of sugar. Out of it 1 litre water vapourises. Find the percentage of sugar in the remaining mixture?
(A) $5 \%$
(B) $7.5 \%$
(C) $6 \%$
(D) $4 \%$
A. (C)
B. (D)
C. (B)
D. (A)

Ans: C
Sol: Sugar in the initial mixture $=(6 / 100) \times$ $5=0.3$ litres

The remaining is water in the mixture.
Thus, Water in the mixture $=5-0.3=4.7$ litres.
Now since 1 ltr water vaporizes:
New quantity of water in mixture $=3.7$ litres.

So, percentage of sugar in final mixture $=$ $(0.3 / 4) \times 100=7.5 \%$
31.Ratio of spirit and water in 20 litre and 36 litre misture are $3: 7$ and $\mathrm{P}: \mathrm{Q}$. If two mixtures and mixed in each other then the ratio of spirit and water is resultant mixture is $27: 29$. Then find $\mathrm{P}: \mathrm{Q}$ :
(A) $3: 2$
(B) $5: 7$
(C) $7: 5$
(D) $4: 5$
A. (D)
B. (A)
C. (B)
D. (C)

## Ans: D

## Sol:

Spirit : Water
3:7---(in 20L mixture)
$(3 \times 20) / 10:(7 \times 20) / 10$
6:14
P : Q ---(36L mixture)
After mixing both the mixtures, the ratio become
27: 29 ---(56L mixture)
$6+\mathrm{P}=27$
$\mathrm{P}=27-6$
$\mathrm{P}=21$
$14+\mathrm{Q}=29$
$\mathrm{Q}=29-14$
$\mathrm{Q}=15$
$\mathrm{P}: \mathrm{Q}=21: 15=7: 5$
Option D is correct.
32.In what ratio a green mix two varieties of tea costing Rs. $400 \mathrm{Rs} / \mathrm{kg}$ of Darjeeling tea and 300 Rs.kg of Assam tea. So as on selling the mixture at Rs 408, he can get $20 \%$ profit?
(A) $1: 2$
(B) $2: 3$
(C) $2: 5$
(D) $1: 6$
A. (A)
B. (C)
C. (D)
D. (B)

Ans: D

## Sol:

We will solve it by mixture \& Alligation method -



Required Ratio $=2: 3$
33.A question and three statements labelled (I), (II) and (III) are given. You have to decide which statement(s) is/are sufficient to answer the question.
Question: What is $40 \%$ of a number?
Statements:
I. $25 \%$ of the number is 60 less than the number.
II. $20 \%$ of the number is an even number.
III. 5\% of twice the number is one tenth of the number.
A. Only I is sufficient.
B. Both II and III are sufficient.
C. Statement II and either I or III are sufficient.
D. Only III is sufficient.

Ans: A

## Sol:

Let the number is x .
I) $\frac{25}{100} x+60=x \Rightarrow \frac{75 x}{100}=60 \Rightarrow \mathrm{x}=80$
II) Insufficient information.
III) $\frac{5}{100} \times 2 \mathrm{x}=\frac{1}{10} \mathrm{x}$, again undecided.
$\therefore$ only (I) is sufficient to find the number.
Hence, option A is the correct answer.
34. What is $7 / 8^{\text {th }}$ of $60 \%$ of 80 ?
A. 42
B. 48
C. 28
D. 56

Ans: A
Sol:

EXAM PREP
$7 / 8^{\text {th }}$ of $60 \%$ of $80=\frac{7}{8} \times \frac{60}{100} \times 80=42$
Hence, option A is the correct answer.
35.A worker's salary was increased by $30 \%$, so that his salary became Rs. 910. How much did he earn before the increase?
A. 1300
B. 880
C. 700
D. 810

Ans: C

## Sol:

Let the salary was 100 x
$\therefore$ New salary, 100x $+30 x=\operatorname{Rs} 910$
$\Rightarrow 130 \mathrm{x}=910$
$\Rightarrow \mathrm{x}=7$
$\therefore$ Initial earning was $100 \mathrm{x}=$ Rs 700
Hence, option C is the correct answer.
36.In a class of 60 students, $60 \%$ are boys. If $25 \%$ of the girls come to school by bicycle. Find the number of girls who don't come cycling to school?
A. 24
B. 27
C. 18
D. 36

## Ans: C

Sol:
Total students $=60$
Number of boys $=60 \times \frac{60}{100}=36$
Number of girls $=60-36=24$
$25 \%$ of the girls come to school by bicycle.
$\Rightarrow$ There are $75 \%$ girls who don't come cycling to school.
$\Rightarrow$ Hence, Number of girls who don't come cycling to school $=\frac{75}{100} \times 24=18$
37.What is $15 \%$ of 38 ?
A. 6
B. 5
C. 5.5
D. 5.7

Ans: D

## Sol:

$15 \%$ of $38=(15 \times 38) / 100=570 / 100=5.7$
Hence, option D is the correct answer.
38.In a class test, a student scored 22 marks out of 25 marks. The student's marks in percentage are:
A. 88
B. 80
C. 90
D. 75

Ans: A

## Sol:

Percentage of the marks scored is $=$ $\frac{22}{25} \times 100=22 \times 4=88 \%$
Hence, option A is the correct answer.
39. When the price of a washing machine was reduced by $30 \%$, its sale increased by $70 \%$. What was the net effect on the revenue?
(A) $44 \%$ decrease (B) $19 \%$ decrease
(C) $44 \%$ increase (D) $19 \%$ increase
A. C
B. A
C. D
D. B

Ans: C
Sol:
Let, The initial price of the washing machine $=10 \mathrm{x}$ unit
Now new price $=7 x$ unit
Also, Initial sales units of the washing machine $=10 \mathrm{y}$ units
Now new sales units $=17 \mathrm{y}$ units
So, Initial revenue $=10 x \times 10 y=100 x y$
New revenue $=7 x \times 17 y=119 x y$
Thus, Percentage change in revenue $=$ $[(119 x y-100 x y) / 100 x y] \times 100$
$\Rightarrow(19 / 100) \times 100=19 \%$ increase

40.Sania won 18 matches out of 27 matches. Find the lost matches in decimal
(A) 0.333
(B) 0.033
(C) 0.50
(D) 0.667
A. (A)
B. (C)
C. (B)
D. (D)

Ans: A
Sol:
Sania won 18 matches out of 27 matches, so she lost 9 matches out of 27 $=\frac{9}{27}=0.333$
41.The population of a village is 3500 , out of which $44 \%$ are men, $35 \%$ women and the rest are children. Find the number of children in the village.
A. 1120
B. 1540
C. 735
D. 1050

Ans: C
Sol: Total Population of man $=3500 \times 44 \%$ $=1540$
Total Population of woman $=3500 \times 35 \%$ $=1225$
Total Population of men and women $=1540$ +1225
$=2765$
Population of children $=3500-2765$
$=735$

## Alternate Approach:

Percentage of children in village $=100-$ $(44+35)=21$
Hence, number of children in village $=$ $(3500 * 21) / 100=735$
42.Tulsiram's salary is $20 \%$ more than that of kashyap. If Tulsiram saves ₹ 720 which is $4 \%$ of his salary, then Kashyap's salary is
A. ₹ 15000
B. ₹ 12000
C. ₹ 10000
D. ₹ 22000

Ans: A
Sol: Let Kashyap's salary be ₹x.
Therefore, Tulsiram's salary $=₹$ $\left(x+\frac{20}{100} x\right)=₹ \frac{6 x}{5}$
Tulsiram saves $₹ 720$ which is $4 \%$ of his salary.
Therefore,
$4 \% \times \frac{6 x}{5}=720 \Rightarrow \frac{4}{100} \times \frac{6 x}{5}=720$
$x=\frac{720 \times 100 \times 5}{24}=\mathrm{x}=₹ 15000$
Thus, Kashyap's salary is ₹ 15000 .
43.5 kg of tea and 8 kg of sugar together cost Rs. 172. The price of tea has risen by $20 \%$ and that of sugar by $10 \%$. Hence the same quantities of tea and sugar now cost Rs. 199.20. What is the original price of tea per kg?
A. Rs. $18 / \mathrm{kg}$
B. Rs. 19/kg
C. Rs. 20/kg
D. Rs. 16/kg

## Ans: C

Sol: Let the price of 1 kg of tea be Rs x and 1 kg of sugar be Rs $y$ Thus $5 \mathrm{x}+8 \mathrm{y}=172$.
New per kg price of tea $=$ Rs $120 \mathrm{x} / 100$
New per kg price of sugar $=$ Rs $110 \mathrm{y} / 100$

EXAM PREP

As per new prices
$5(120 x / 100)+8(110 x / 100)=199.20$
Thus $6 \mathrm{x}+44 \mathrm{y} / 5=$ 199.20 (ii)

From Equation (i)
$x=(172-8 y) / 5$ $\qquad$ (iii)

Substituting the value of y in equation(ii) we get;
$1032-4 y=996$
$y=9$
Substituting the value of y in (iii); we get
$\mathrm{x}=$ Rs 20 per kg
Hence Option C is correct
44.Ravi invested ₹ 913 partly in $4 \%$ stock at ₹ 97 and partly in $5 \%$ stock at ₹ 107 . If his income from both is equal, amount invested on first stock was
A. ₹ 750
B. ₹ 525
C. ₹ 610
D. ₹ 485

Ans: D
Sol: Let he invests ₹ x in $4 \%$ stock and ₹ y in 5\% stock
On ₹ 97 he earns Rs.4.On ₹ $x$ he earns $4 x / 97$
Similarly on ₹ y he will earns $5 \mathrm{y} / 107$
$4 \mathrm{x} / 97=5 \mathrm{y} / 107$
$\mathrm{X}=485 \mathrm{y} / 428$
$X+y=913$
Substituting the value of x we get $\mathrm{y}=428$
First installment $=₹ 485$
45.The price of sugar is reduced by $20 \%$. Now, a person can buy 500 g more sugar for ₹ 36 . The original price of the sugar per kilogram was
A. ₹ 14.40
B. ₹ 18
C. ₹ 15.60
D. ₹ 16.50

Ans: B

## Sol:

Let the original price of sugar be Rs. $x / \mathrm{kg}$.

$$
\begin{array}{rlrl}
\therefore & & \text { Reduced price of sugar } & =x-\frac{20 x}{100} \\
& =\text { Rs. } \frac{4 x}{5} \\
& \therefore \quad \frac{36}{\frac{3 x}{5}}-\frac{36}{x} & =0.5 \\
\Rightarrow & & \frac{45}{x}-\frac{36}{x} & =0.5 \\
\Rightarrow & & \frac{9}{x} & =0.5 \\
\therefore & & x & =\frac{9}{0.5} \\
& & & =\mathrm{Rs} .18 / \mathrm{kg}
\end{array}
$$

Hence, option B is correct.
46. Production of sugar in 2001 was 1584 million which was $20 \%$ more than 1991's production. Find the production of sugar in 1991. (In million kg.)
(A) 1320
(B) 1280
(C) 1900
(D) 1920
A. (A)
B. (B)
C. (D)
D. (C)

Ans: A
Sol:
Production in $2001=20 \%$ more than production in $1991=1584$ million kg $120 \%$ of production in $1991=1584$ million kg

Production in $1991=1584 \times(100 / 120)=$ 1320 million kg
47.A batsman scored 150 runs in a one-day cricket match. He hit 20 fours and 5 sixes. Calculate the percentage of runs he scored by running between the wickets.
A. $25 \%$
B. $73.33 \%$
C. 25.67
D. $26.67 \%$

Ans: D

## Sol:

A batsman scored 150 runs in a one-day cricket match.
Number of fours $=20$
Number of sixes $=5$
Number of runs scored by fours and sixes $=$ $20 \times 4+5 \times 6=80+30=110$
Number of runs scored by running between the wickets $=150-110=40$
Required percentage $=\frac{40}{150} \times 100=26.67 \%$
48.In a class test, a student scored 9 out of 25 marks. The student's marks expressed as a percentage is:
A. 30
B. 36
C. 35
D. 25

## Ans: B

## Sol:

In a class test, a student scored 9 out of 25 marks.
Percentage of marks scored = $\frac{9}{25} \times 100=36 \%$
49.A person pays Rs. 8960 per month towards loan repayment which is $28 \%$ of his monthly salary. Calculate his monthly salary.
A. Rs. 32,000
B. Rs. 34,000
C. Rs. 28,000
D. Rs. 30,000

## Ans: A

Sol: A person pays Rs. 8960 per month towards loan repayment which is $28 \%$ of his monthly salary.
=> $28 \%$ of his monthly salary $=$ Rs. 8960
=> $1 \%$ of his monthly salary = Rs. 320
=> $100 \%$ of his monthly salary $=$ Rs. 32000
50.If a student's marks were increased by $25 \%$, he would have scored 75 in his test. How much did he actually score?
A. 60
B. 50
C. 15
D. 25

Ans: A

## Sol:

$125 \%$ of the student's marks $=75$
$100 \%$ of the student's marks $=(75 / 125) \times$ $100=60$
Hence, Required marks $=60$
51.The monthly salaries of P and Q are in the ratio 4:3. If $P$ and $Q$ get an increase of $10 \%$ and $5 \%$ of their existing salaries respectively, what will be the new ratio?
A. $88: 63$
B. $63: 88$
C. $45: 60$
D. $60: 45$

Ans: A
Sol: The monthly salaries of P and Q are in the ratio 4:3.
Let monthly salary of $P=4 k$
Monthly salary of $\mathrm{Q}=3 \mathrm{k}$
$P$ and Q get an increase of $10 \%$ and $5 \%$ of their existing salaries respectively.
New salary of $P=$
$4 k+4 k \times \frac{10}{100}=4 k+0.4 k=4.4 k$

New salary of $\mathrm{Q}=$
$3 k+3 k \times \frac{5}{100}=3 k+0.15 k=3.15 k$
New Ratio $=4.4 \mathrm{k}: 3.15 \mathrm{k}=440: 315=$ 88:63
52. A container has two holes. The $1^{\text {st }}$ hole alone empties the container in 15 minutes and $2^{\text {nd }}$ hole alone empties the container in 10 minutes. If water leaks out at a constant rate, how long (in minutes) does it take if both the holes together empty the container?
A. 6
B. $1 / 6$
C. $1 / 7$
D. 7

## Ans: A

## Sol:

Time taken by $1^{\text {st }}$ hole to empties the container $=15$ minute
Time taken by $2^{\text {nd }}$ hole to empties the container $=10$ minute
Let total capacity of container $=\mathrm{LCM}(15$, 10) $=30$ UNIT

Efficiency of $1^{\text {st }}$ hole $=\frac{30}{15}=2$ unit
Efficiency of $2^{\text {nd }}$ hole $=\frac{30}{10}=3$ unit
Time taken by both the holes together empty the container $=\frac{30}{2+3}=6 \mathrm{~m}$ inute
53.It takes 12.5 minutes to completely fill a vessel with juice. However, kids are continuously drinking juice from the vessel at a rate which can empty the vessel in 25 minutes. A the current rate, how long will it take to completely fill the vessel?
A. 20 minutes
B. 12.5 minutes
C. 25 minutes
D. 30 minutes

Ans: C

## Sol:

Time taken to fill the vessel with juice completely $=12.5$ minutes
$\Rightarrow$ Time taken by kids to emptying the vessel $=25$ minutes
Let capacity of the vessel $=\operatorname{LCM}(12.5,25$ ) $=25$ unit
Efficiency of filling the vessel = $\frac{25}{12.5}=2$ unit
Efficiency of emptying the vessel = $-\frac{25}{25}=-1$ unit
Net efficiency of both $=2-1=1$ unit
At the current rate, how long will it take to completely fill the vessel = $\frac{25}{1}=25$ minutes
54.A flask has two holes. The first hole alone makes the full flask empty in 9 minutes and second hold alone makes the full flask empty in 16 minutes. If water leaks out at a constant rate, how long in minutes does it take if both the holes together empty the flask?
(A) $\frac{19}{25}$
(B) $4 \frac{19}{25}$
(C) $5 \frac{20}{25}$
(D) $5 \frac{19}{25}$
A. (A)
B. (C)
C. (B)
D. (D)

Ans: D

## Sol:

Let the capacity of tank be (LCM of 9 and 16) $=144$ units

Number of units emptied by first hole in 1 minute $=144 / 9=16$ units $/ \mathrm{min}$

Number of units emptied by second hole in 1 minute $=144 / 16=9$ units $/ \mathrm{min}$

Total units emptied by both the pipes together $=25$ units $/ \mathrm{min}$

Time taken by both the pipes together to empty the tank $=144 / 25=5 \frac{19}{25}$ units
55.In terms of percentage profit, which of the following transactions is the best?
A. Cost Price $=60$, Profit $=32$
B. Cost Price $=80$, Profit $=44$
C. Cost Price $=50$, Profit $=26$
D. Cost Price $=70$, Profit $=40$

Ans: D

## Sol:

When Cost Price $=60$, Profit $=32$
Profit $\%=\frac{32}{60} \times 100=53.3 \%$
When Cost Price $=80$, Profit $=44$
Profit $\%=\frac{44}{80} \times 100=55 \%$
When Cost Price $=50$, Profit $=26$
Profit $\%=\frac{26}{50} \times 100=52 \%$
When Cost Price $=70$, Profit $=40$
Profit $\%=\frac{40}{70} \times 100=57.14 \%$
Hence, In terms of profit \%, transactions given in option D is best.
56.A shopkeeper cheats to the extent of $22 \%$ while buying and selling fruits, by using tampered weights. His total gain in percentage is:
A. $48.5 \%$
B. $48.84 \%$
C. $48.25 \%$
D. $48.75 \%$

Ans: B

## Sol:

It is given that a shopkeeper cheats to the extent of $22 \%$ while buying and selling fruits, by using tampered weights.
Common gain $=22 \%$
Gain\% =
$\left[\frac{(100+\text { common gain } \%)^{2}}{100}-100\right] \%=$
$\left[\frac{(100+22)^{2}}{100}-100\right] \%$
=
$\left[\frac{14884}{100}-100\right] \%=[148.84-100] \%=48.84 \%$
57.The cash difference between the selling price of an article at a profit of $8 \%$ and $12 \%$ is Rs. 3 . The ratio of two selling prices is:
A. $27: 28$
B. $27: 29$
C. $29: 31$
D. $27: 31$

Ans: A

## Sol:

Let cost price of an article $=100$ unit
Profit $=8 \%$
Selling price of the article $=100$ unit +8 unit $=108$ unit
When profit $=12 \%$
Selling price of the article $=100$ unit +12
unit $=112$ unit
According to question
$\Rightarrow 4$ unit $=$ Rs. 3
$\Rightarrow 1$ unit $=$ Rs. $\frac{3}{4}$
Ratio of two selling prices = $108 \times \frac{3}{4}: 112 \times \frac{3}{4}=108: 112=27: 28$
58.A man buys a refrigerator at Rs. 22,000 and pays an additional Rs. 1,000 for transport and Rs. 2,000 for installation. What should be the selling price to get a profit of $15 \%$ on the whole transaction?
A. Rs. 27,250
B. Rs. 28,500
C. Rs. 28,750
D. Rs. 29,250

## Ans: C

## Sol:

The man buys a refrigerator at Rs. 22,000 and pays an additional Rs. 1,000 for transport and Rs. 2,000 for installation.
Net cost price of refrigerator $=$ Rs 25000
Profit = 15\%
Selling price $=(115 / 100) \times 25000=$ Rs 28,750
59.8 boxes of a fruit were purchased for Rs. $9,600.5$ boxes were sold at a profit of $10 \%$ and 3 boxes were sold at a loss of $10 \%$. What is the net gain in percentage?
A. $2.75 \%$
B. $2.5 \%$
C. $2 \%$
D. $2.25 \%$

Ans: B
Sol: 8 boxes of a fruit were purchased for Rs. 9,600.
It is given that 5 boxes were sold at a profit of $10 \%$ and 3 boxes were sold at a loss of $10 \%$.
Net gain in percentage = $\frac{5 \times 10 \%-3 \times 10 \%}{8}=\frac{50 \%-30 \%}{8}=\frac{20 \%}{8}=2.5 \%$
60.The cost price of a set of 2 pants +4 shirts or 1 pant +6 shirts is Rs. 5,600 . A shopkeeper decided to sell them separately. He sold 10 shirts for Rs. 6,000. Find the amount of profit or loss per shirt.
A. Profit Rs. 1000
B. Loss Rs. 1000
C. Profit Rs. 100
D. Loss Rs. 100

Ans: D
Sol: The cost price of a set of 2 pants +4 shirts or 1 pant +6 shirts is Rs. 5,600 .
Cost price of 2 pants +4 shirts $=$ Rs. 5600
$\qquad$ .(1)
Cost price of 1 pant +6 shirts $=$ Rs. 5600 $\qquad$ .(2)

## Multiply equation (2) by 2

Cost price of 2 pant +12 shirts $=$ Rs. 11200
Subtract (1) from (3)
Cost price of 8 shirts $=$ Rs. 5600
Cost price of 1 shirt = Rs. 700
He sold 10 shirts for Rs. 6,000.
Selling price of 1 shirt = Rs. 600
Loss $=$ Cost price - Selling price $=$ Rs. 700

- Rs. $600=$ Rs. 100
61.An article was sold for Rs. 2500 at a profit of $25 \%$. What was the amount of profit?
A. Rs. 1000
B. Rs. 500
C. Rs. 250
D. Rs. 2000


## Ans: B

## Sol:

$125 \%$ of $\mathrm{CP}=$ Rs 2500
$25 \%$ of $\mathrm{CP}=$ Rs 500
62.160 cycles were sold for Rs. 524,000 resulting in a loss of $10 \%$. What was the cost price of a cycle (in Rs.)? (rounded off to the nearest rupee)
A. 3275
B. 3639
C. 4321
D. 4763

## Ans: B

Sol:
Selling price of 160 cycles $=$ Rs. 524,000
Loss $=10 \%$
Cost price of 160 cycles =
$524,000 \times \frac{100}{90}=582222$

Cost price of 1 cycles $=\frac{582222}{160}=3639$
63.Manu's piggy bank contains Rs. 221 in the form of 50 paise, Rs. 1 and Rs. 2 coins in the ratio of $4: 3: 6$. What is the number of 50 paise coins in the piggy bank?
A. 52
B. 13
C. 104
D. 26

Ans: A

## Sol:

Manu's piggy bank contains Rs. 221 in the form of 50 paise, Rs. 1 and Rs. 2 coins in the ratio of $4: 3: 6$.
Let number of 50 paise coins $=4 \mathrm{x}$
Number of Rs. 1coins $=3 \mathrm{x}$
Number of Rs. 2 coins $=6 \mathrm{x}$
Now, Amount in the form of 50 paise coins $=2 \mathrm{x}$
Amount in the form of Rs. 1 coins $=3 \mathrm{x}$
Amount in the form of Rs. 2 coins $=12 \mathrm{x}$
A.T.Q.
$\Rightarrow 2 \mathrm{x}+3 \mathrm{x}+12 \mathrm{x}=$ Rs. 221
$\Rightarrow 17 \mathrm{x}=$ Rs. 221
$\Rightarrow \mathrm{x}=13$
Hence. number of 50 paise coins $=52$
64.There are total 200 students in a school, of which one fifth are boys. Find the number of girls in the school?
A. 160
B. 16
C. 140
D. 40

Ans: A
Sol:
Since, the one fifth of the total are boys, Hence, four fifth of the total will be girls. $\Rightarrow(4 / 5) \times 200=160$
Hence, option A is the correct answer.
65.There are total 200 students in a school, of which $3 / 10^{\text {th }}$ are boys. Find the number of girls in the school.
A. 60
B. 140
C. 40
D. 120

Ans: B
Sol:
Since boys are $3 / 10^{\text {th }}$ of the total students,
$\therefore$ Girls will be $7 / 10^{\text {th }}$ of the total students.
Number of girls are $=(7 / 10) \times 200=140$
Hence, option B is the correct answer.
66.Divide Rs. 210 in the ratio 2: 3: 4: 5. The respective amounts are:
A. $30,45,65$ and 70
B. $30,45,60$ and 75
C. $35,40,60$ and 75
D. $30,40,60$ and 80

## Ans: B

## Sol:

Let the amounts be $2 \mathrm{x}, 3 \mathrm{x}, 4 \mathrm{x}$ and 5 x respectively.
$\therefore$ Total amount is $=2 \mathrm{x}+3 \mathrm{x}+4 \mathrm{x}+5 \mathrm{x}=$ 14x
Given, $14 \mathrm{x}=210 ; \mathrm{x}=1$
So, the amounts are
$2 \times 15=30 ; 3 \times 15=45 ; 4 \times 15=60 ; 5 \times 15=$ 75
Hence, option B is the correct answer.
67.Two buses travel to a place at the speed of $45 \mathrm{~km} / \mathrm{hr}$ and $60 \mathrm{~km} / \mathrm{hr}$ respectively. If the second bus takes $5 \frac{1}{2}$ hours less than the first for the same journey, find the length of the journey.
A. 950 km
B. 1000 km
C. 990 km
D. 1050 km

Ans: C

## Sol:

Let $x$ be the distance of the journey.
Time taken by the First bus $=\frac{\mathrm{x}}{45} \mathrm{hr}$
Time taken by the Second bus $=\frac{\mathrm{x}}{60} \mathrm{hr}$
A.T.Q.:
$\frac{\mathrm{x}}{45}-\frac{\mathrm{x}}{60}=5 \frac{1}{2}=\frac{11}{2} \mathrm{hr}$
$\mathrm{x}=990 \mathrm{~km}$
68. A car covers a certain distance in 8 hours at a speed of 50 kmph . What should be the increase in speed to cover the same distance in 5 hours.
A. 50 kmph
B. 40 kmph
C. 30 kmph
D. 80 kmph

Ans: C

## Sol:

Distance $=8 \times 50=400 \mathrm{~km}$
If time taken is 5 hrs ,
$\therefore$ Speed $=400 / 5=80 \mathrm{~km} / \mathrm{hr}$
$\therefore$ Increase in speed $=80-50=30 \mathrm{~km} / \mathrm{hr}$
Hence, option C is the correct answer.
69.A cyclist covers a distance of 14 km in 25 minutes. How much distance will he cover in 18 minutes (in km )?
A. 9.4
B. 9.78
C. 10.26
D. 10.08

## Ans: D

## Sol:

Distance covered by cyclist in 25 minutes $=$ 14 km
Distance covered by cyclist in 25 minutes $=$ $\frac{14}{25} \mathrm{~km}$

Distance covered by cyclist in 18 minutes $=$ $\frac{14}{25} \times 18=\frac{252}{25}=10.08 \mathrm{~km}$
70.Speed of Boat against the stream is 40 $\mathrm{km} / \mathrm{hr}$ and in still water is $55 \mathrm{~km} / \mathrm{hr}$. Calculate the speed of boat with the flow of stream
(A) $75 \mathrm{~km} / \mathrm{hr}$
(B) $70 \mathrm{~km} / \mathrm{hr}$
(C) $60 \mathrm{~km} / \mathrm{hr}$
(D) $65 \mathrm{~km} / \mathrm{hr}$
A. (D)
B. (A)
C. (C)
D. (B)

## Ans: D

Sol:
Let Speed of stream is W kmph
Speed of boat in still water $B=55 \mathrm{kmph}$
Speed of boat in upstream $=B-W=40$ kmph $\qquad$ .(given)

Speed of stream $\mathrm{W}=55-40=15 \mathrm{kmph}$
Speed of boat in Downstream $=\mathrm{B}+\mathrm{W}=55$ $+15=70 \mathrm{kmph}$
71. Two school vans start from a house at an interval of 8 minutes and travel with a speed of $25 \mathrm{~km} / \mathrm{hr}$. With how much speed (km/hr) should a woman coming from the opposite direction towards the house travel, to meet the vans at an interval of 4 minutes?
A. 25
B. 27
C. 26
D. 24

## Ans: A

## Sol:

Two school vans start from a house at an interval of 8 minutes and travel with a speed of $25 \mathrm{~km} / \mathrm{hr}$.
$\Rightarrow$ Distance covered by school vans in 8 minutes @ $25 \mathrm{~km} / \mathrm{hr}=$ Distance covered by women in 4 minutes @ $\mathrm{xkm} / \mathrm{hr}$
$\Rightarrow 25 \times \frac{8}{60}=(25+x) \times \frac{4}{60}$
$\Rightarrow 50=25+\mathrm{x}$
$\Rightarrow \mathrm{x}=25 \mathrm{kmph}$
Hence, Speed of the women $=25 \mathrm{kmph}$.
72. The speed of car M is twice that of car
W. If car M covers 120 km in $2 \mathrm{hrs} \& 30$ mins, what is the speed of car W?
A. 36 kmph
B. 48 kmph
C. 24 kmph
D. 42 kmph

Ans: C
Sol: Car M covers 120 km in $2 \mathrm{hrs} \& 30$ mins.
Speed of car $\mathrm{M}=$ $\frac{120}{2 \frac{1}{2}}=\frac{120}{5} \times 2=24 \times 2=48 \mathrm{~km} / \mathrm{hrs}$
The speed of car M is twice that of car W .
Speed of car $\mathrm{W}=\frac{48}{2}=24 \mathrm{kmph}$
73. Arun and Amit can do a work in 9 and 12 days respectively. If they work alternatively and first Amit starts then. How many days will require to complete $35 / 36$ part of the work?
(A) 10 days (B) 12 days
(C) 5 days (D) 8 days
A. (C)
B. (A)
C. (D)
D. (B)

Ans: B
Sol: A.T.Q.
Amit and Arun can individually complete the work in 12 and 9 days respectively.

Now LCM of $(9,12)=36$ units is the total work.
So, the efficiency of Amit and Arun will be 3 units and 4 units respectively.

Amit will start the work and on Alternate days Arun will follow him.
so,

Total work done in two days $=3+4=7$ units
so, 35 units out of 36 will be done in $=5 \times 2$ days $=10$ days.
74. Atul and Vinay can complete work in 5 days by working together. If Vinay can complete the work alone in 8 days. Then how many days will Atul take to finish the work alone?
(A) ${ }^{\frac{40}{3}}$ days (B) ${ }^{\frac{20}{3}}$ days
(C) 9 days (D) 10 days
A. D
B. C
C. B
D. A

Ans: D
Sol: .
Let the total work be $=\operatorname{LCM}(5,8)=40$

Efficiency of Atul and Vinay $=\frac{40}{5}=8$ unit

Efficiency of Vinay $=\frac{40}{8}=5$ unit

Atul's Efficiency $=8-5=3$ unit
Required time for Atul $=\frac{40}{3}$ days.
75.Akshat is twice as good a typist as Lokesh and together they finish a piece of work in 7 days. In how many days will Lokesh alone finish the work?
A. 14
B. 10
C. 28
D. 21

Ans: D

## Sol:

Let the efficiencies of Akshat and Lokesh are 2 and 1 unit/day respectively.
Total work $=3 \times 7=21$ units
$\therefore$ Days taken by Lokesh to complete the work $=21 / 1=21$ days
Hence, option D is the correct answer.
76.Mr. Rajesh is twice as good a worker as Mr. Vishal and together they finish a piece of work in 28 days. In how many days will Vishal alone finish the work?
A. 56
B. 112
C. 84
D. 80

Ans: C
Sol: Mr. Rajesh is twice as good a worker as Mr. Vishal and together they finish a piece of work in 28 days.
One day work of Mr. Rajesh and Mr. Vishal together $=\frac{1}{28}$ unit
Let Number of days taken by Mr. Vishal to complete the work $=2 \mathrm{x}$
Number of days taken by Mr. Rajesh to complete the work $=x$
One day work of Mr. Vishal $=\frac{1}{2 x}$ unit

One day work of Mr. Rajesh $=\frac{1}{x}$ unit
According to question
$\Rightarrow \frac{1}{x}+\frac{1}{2 x}=\frac{1}{28}$
$\Rightarrow \frac{2+1}{2 x}=\frac{1}{28}$
$\Rightarrow \frac{3}{2 x}=\frac{1}{28}$
$\Rightarrow 2 x=28 \times 3=84$
Hence, Number of days taken by Mr. Vishal to complete the work $=2 \mathrm{x}=84$
77.Amrit is twice as good a painter as Kushal and together they finish a piece of work in 6 days. In how many days will Kushal alone finish the work?
A. 10
B. 12
C. 24
D. 18

Ans: D
Sol:
Amrit is twice as good a painter as Kushal.
Let Efficiency of Kushal = 1 unit
Then Efficiency of Amrit =2 unit
It is given that they finish a piece of work in 6 days.
Let total work $=6 \times 3=18$ unit.
Number of days taken by Kushal to finish the work $=\frac{18}{1}=18$ days
78.The areas of two similar triangles are 169 sq cm . and 121 sq cms . If the longest side of larger triangle is 26 cm , then the length of the longest side of the other triangle is $\qquad$ -.
A. 26 cm
B. 18 cm
C. 28 cm
D. 22 cm

## Ans: D

## Sol:

The areas of two similar triangles are 169 sq cm. and $121 \mathrm{sq} \mathrm{cms}$.
$\Rightarrow \frac{\operatorname{ar}(\triangle A B C)}{\operatorname{ar}(\triangle P Q R)}=\left(\frac{\text { longest side of } \mathrm{ABC}}{\text { longest side of } \mathrm{PQR}}\right)^{2}$
$\Rightarrow \frac{169}{121}=\left(\frac{26}{x}\right)^{2}$
$\Rightarrow \frac{26}{x}=\frac{13}{11}$
$\Rightarrow \mathrm{x}=22 \mathrm{~cm}$
Hence, the length of the longest side of the other triangle $=22 \mathrm{~cm}$
79.A wheel has a diameter of 84 cm . How many revolutions should it make to cover a distance of 792 m ? $(\Pi=22 / 7)$
A. 298
B. 300
C. 312
D. 256

## Ans: B

## Sol:

Radius(r) $=84 / 2=42 \mathrm{~cm}$
Circumference of the wheel, $2 \Pi r=$ $2 \times \frac{22}{7} \times 42=264 \mathrm{~cm}$
Now, revolutions made by the wheel will be $=79200 / 264=300$
Hence, option B is the correct answer.
80.The number of sides of a regular polygon whose interior angles are $168^{\circ}$ each is:
A. 20
B. 30
C. 15
D. 31

Ans: B
Sol:
Exterior angle $=180-168=12^{\circ}$
Number of sides $=360 \div$ exterior angle $=$ $360 \div 12=30$ sides

Hence, option B is the correct answer.
81.Two arcs of two different circles are of equal lengths. If these arcs subtend angle of $65^{\circ}$ and $104^{\circ}$ at the centres of the circles. Find the ratio of the radii of the two circles.
(A) $8: 5$ (B) $13: 7$
(C) $5: 8$ (D) $7: 13$
A. B
B. D
C. A
D. C

## Ans: C

## Sol:

Let $r_{1}$ and $r_{2}$ be the radii of the two circles and " $l$ " be the length of each arc. And the angles subtend at the centre are $65^{\circ}$ and $104^{\circ}$ respectively.
We know that, arc length " $l$ " = r. $\theta$
Here, $\mathrm{r}_{1 .} \theta_{1}=\mathrm{r}_{2} . \theta_{2}$
$\Rightarrow \mathrm{r}_{1} / \mathrm{r}_{2}=\theta_{2} / \theta_{1}=104^{\circ} / 65^{\circ}$
$\Rightarrow \mathrm{r}_{1} / \mathrm{r}_{2}=8 / 5$
82.The length of the three sides of a right angled triangle are ( $\mathrm{x}-2$ ) $\mathrm{cm}, \mathrm{x} \mathrm{cm}$ and ( x $+2) \mathrm{cm}$ respectively. Then the value of $x$ is
A. 10
B. 8
C. 4
D. 0

## Ans: B

Sol: In right angled triangle (Hypotenuse) ${ }^{2}$ $=(\text { Base })^{2}+(\text { Perpendicular })^{2}$
$(x+2)^{2}=x^{2}+(x-2)^{2}$
$x^{2}+4 x+4=x^{2}+x^{2}-4 x+4$
$\mathrm{x}^{2}=8 \mathrm{x}$
$\mathrm{x}=8$
83. Water flows in a Tank $150 \mathrm{~m} \times 100 \mathrm{~m}$ at the base, thought a pipe whose cross section is 2 dm by 1.5 dm , at the speed of $15 \mathrm{~km} / \mathrm{h}$. In what time will the water be 3 m deep?
A. 100 h
B. 120 h
C. 140 h
D. 150 h

Ans: A
Sol: $\quad$ Required
$2 \times 10 \times 1.5 \times 10 \times 15 \times 1000$
$150 \times 100 \times 3$
$[\because 1 \mathrm{dm}=10 \mathrm{~m}]$
$=\frac{20 \times 15 \times 15 \times 1000}{150 \times 100 \times 3}$
$=100 \mathrm{~h}$
84.The volume (in cubic cm ) of a right circular cylinder with radius 1 cm and height 2 cm is: $(\pi=22 / 7)$
A. $22 / 7$
B. 22
C. 44
D. $44 / 7$

Ans: D

## Sol:

As we know that volume of right circular cylinder $=\pi r^{2} h$
Here, $\mathrm{r}=1 \mathrm{~cm}$ and $\mathrm{h}=2 \mathrm{~cm}$

$$
\begin{aligned}
& \therefore \quad \text { volume } \\
& \frac{22}{7} \times 2=\frac{44}{7} \mathrm{~cm}^{3}
\end{aligned}=
$$

Hence, option D is the correct answer.
85.The ratio between the length and breadth of a rectangular board is $7: 5$. If the breadth of the board is 20.5 cm , find the length in cm.
A. 19.9
B. 24.3
C. 28.7
D. 14.6

Ans: C

## Sol:

The ratio between the length and breadth of a rectangular board is 7:5.
Let length of a rectangular board $=7 x$
Breadth of a rectangular board $=5 x$
The breadth of the board $=20.5 \mathrm{~cm}$
A.T.Q.
$\Rightarrow 5 \mathrm{x}=20.5 \mathrm{~cm}$
$\Rightarrow \mathrm{x}=4.1 \mathrm{~cm}$
$\Rightarrow 7 \mathrm{x}=28.7 \mathrm{~cm}$
length of a rectangular board $=28.7 \mathrm{~cm}$
86. Given the sides of a triangles as 3.4 cm and 5.2 cm , what can be the length of the third side ( x ) in cm ?
A. $1.8<\mathrm{x}<8.6$
B. $>8.6$
C. $<1.8$
D. $3.4<\mathrm{x}<5.2$

## Ans: A

## Sol:

Given the sides of a triangles as 3.4 cm and 5.2 cm .

If two sides of a triangle are given then third side of the triangle is always greater than the difference of two given sides and always less than the sum of two given sides.
Hence, $(5.2-3.4)<x<(5.2+3.4)$
$\Rightarrow 1.8<\mathrm{x}<8.6$
87.A rectangular water reservoir contains 42,000 litres of water. Find the depth of water in the reservoir, if the base measures 6 m by 3.5 m .
A. 1 m
B. 2.5 m
C. 3 m
D. 2 m

Ans: D

## Sol:

Let the depth of the water reservoir $=\mathrm{x}$ meter
According to question

$$
\begin{aligned}
& \quad 6 \times 3.5 \times x=\frac{42000}{1000} \mathrm{~m}^{3} \\
& \Rightarrow \\
& \Rightarrow x=2 \mathrm{~m}
\end{aligned}
$$

88. The volume (in cubic cm ) of a right cylinder with radius 2.5 cm and height 2 cm is: (Take $\varpi=22 / 7$ )

A. 275
B. $275 / 21$
C. $275 / 2$
D. $275 / 7$

Ans: D

## Sol:

Volume of the right circular cylinder,
$\Pi r^{2} h=\frac{22}{7} \times\left(\frac{5}{2}\right)^{2} \times 2=\frac{275}{7}$
Hence, option D is the correct answer.
89.Find out which of the following sets form co-prime numbers.
A. $(12,7)$
B. $(2,42)$
C. $(3,9)$
D. $(43,129)$

Ans: A
Sol: Two numbers forms a set of co-prime when their HCF is 1.
$\operatorname{HCF}(12,7)=1$
$\operatorname{HCF}(2,42)=2$
$\operatorname{HCF}(3,9)=3$
$\operatorname{HCF}(43,129)=43$
Hence, ( 12,7 ) is a set of co-prime numbers.
90.If two-third of three-fifth of a number is

42 , find one-third of that number?
A. 40
B. 30
C. 45
D. 35

## Ans: D

Sol: It is given that two-third of three-fifth of a number is 42
Let that number be x .
$\Rightarrow \frac{2}{3} \times \frac{3}{5} \times x=42$
$\Rightarrow \quad x=42 \times \frac{5}{3} \times \frac{3}{2}=105$
Now, one-third of $x=\frac{105}{3}=35$
91.From the given options, find the rational number between $2 / 4$ and 0.6
A. $11 / 25$
B. $21 / 40$
C. $3 / 4$
D. $11 / 4$

Ans: B
Sol:
$2 / 4=0.5 ; 11 / 25=0.44 ; 21 / 40=0.525 ; 3 / 4$ $=0.75 ; 11 / 4=2.75$
$\therefore 0.525$ i.e. $21 / 40$ lies between $2 / 4$ and 0.6
92.If $1 / 43.21=0.02314$; then $1 / 0.0004321$
A. 23.14
B. 2314
C. 0.0002314
D. 231.4

Ans: B

## Sol:

$1 / 0.0004321=10^{5} \times(1 / 43.21)=10^{5} \times$ $0.02314=2314$
Hence, option B is the correct answer.
93.Find the difference between the smallest number of five digits and greatest number of four digits?
A. 3
B. 2
C. 0
D. 1

Ans: D

## Sol:

smallest number of five digits $=10000$
greatest number of four digits $=9999$
Required difference $=10000-9999=1$
94.Solve : $4 / 11+2 / 7+3 / 5$ ?
A. $37 / 35$
B. $481 / 385$
C. $13 / 35$
D. $37 / 385$

Ans: B

## Sol:

Consider $4 / 11+2 / 7+3 / 5$
$\Rightarrow \frac{4}{11}+\frac{2}{7}+\frac{3}{5}=\frac{140}{385}+\frac{110}{385}+\frac{231}{385}=\frac{481}{385}$
95.Solve : $0.275+0.569-0.336 ?$
A. 0.123
B. 0.508
C. 0.457
D. 0.594

Ans: B
Sol:
$0.275+0.569-0.336=0.508$
96.Solve : $345678 \times 999999$ ?
A. 345677653422
B. 354677654322
C. 345677654322
D. 346577564322

Ans: C

## Sol:

$345678 \quad \mathrm{x} \quad 999999$ =
$345678 \times(1000000-1)=345678000000-345678=$ 345677654322
97.Simplify: $3 x(x+4)-x(x-2)$
A. $2 x^{2}+14 x$
B. $4 x^{2}-14 x$
C. $4 x^{2}+14 x$
D. $2 x^{2}-14 x$

Ans: A

## Sol:

Consider: $3 x(x+4)-x(x-2)$
$\Rightarrow 3 x^{2}+12 x-x^{2}+2 x=2 x^{2}+14 x$.
98.Simplify: $(2.25)^{(1 / 2)}$
A. 1.5
B. 15
C. 1.6
D. $2 / 3$

Ans: A

## Sol:

Consider: $(2.25)^{(1 / 2)}=(1.5 \times 1.5)^{(1 / 2)}=1.5$
99.Compute: $4992 \div 624-10$
A. $2469 / 307$
B. -2
C. 2
D. $2496 / 307$

## Ans: B

## Sol:

Consider $4992 \div 624-10$
$\Rightarrow 8-10=-2$
100.The value of $(0.3)^{2} \div 100=$ ?
A. 0.09
B. 0.0009
C. 0.0 .09
D. 0.9

Ans: B
Sol:
Consider $(0.3)^{2} \div 100$
$\Rightarrow \frac{0.09}{100}=0.0009$
101.Solve for 'a': $\frac{7}{a-2}=\frac{5}{a+4}$
A. -19
B. 38
C. 19
D. -38

Ans: A

## Sol:

$\frac{7}{a-2}=\frac{5}{a+4}$
$\Rightarrow 7 \mathrm{a}+28=5 \mathrm{a}-10$
$\Rightarrow \mathrm{a}=-19$
Hence, option A is the correct answer.
$102.3 .0 \times 0.3 \times 0.03 \times 0.003=$ ?
A. $81 \times 10^{-4}$
B. $81 \times 10^{-7}$
C. $81 \times 10^{-5}$
D. $81 \times 10^{-6}$

Ans: D

EXAM PREP

## Sol:

$3.0 \times 0.3 \times 0.03 \times 0.003$
$=3^{4} \times(10)^{-6}$
$=81 \times(10)^{-6}$
Hence, option D is the correct answer.
103.Solve: $\frac{1.13+5.884}{2.004}$
A. 3.44
B. 3.05
C. 2.95
D. 3.50

Ans: D
Sol:
$\frac{1.13+5.884}{2.004}=\frac{7.014}{2.004}=3.5$
104.Solve : $\left(3.2 \times 10^{4}\right) \div\left(2 \times 10^{5}\right)$
A. $\frac{16}{10^{2}}$
B. 0.016
C. 1.6
D. 1.06

Ans: A

## Sol:

Consider $\left(3.2 \times 10^{4}\right) \div\left(2 \times 10^{5}\right)$
$\Rightarrow \frac{3.2 \times 10^{4}}{2 \times 10^{5}}=\frac{1.6}{10}=\frac{16}{10^{2}}$
105.Simplify: $\left(a^{-1}+b^{-1}\right) \div\left(a^{-2}-b^{-2}\right)$
A. $\frac{a b}{b-a}$
B. $\frac{a+b}{a b}$
C. $\frac{a b}{a-b}$
D. $\frac{a}{b}$

Ans: A

Sol:
$\left(\mathrm{a}^{-1}+\mathrm{b}^{-1}\right) \div\left(\mathrm{a}^{-2}-\mathrm{b}^{-2}\right)=$
$\frac{\left(\frac{1}{a}+\frac{1}{b}\right)}{\left(\frac{1}{a^{2}}-\frac{1}{b^{2}}\right)}=\frac{\frac{a+b}{a b}}{\frac{b^{2}-a^{2}}{a^{2} \cdot b^{2}}}=\frac{(a+b)\left(a^{2} \cdot b^{2}\right)}{(a b)\left(b^{2}-a^{2}\right)}=\frac{a b}{b-a}$
106.Fractional expression of $0.06 \overline{54}$.
(The bar indicates repeating decimal)
A. 18/275
B. $18 / 277$
C. 654
D. $654 / 1000$

Ans: A
Sol:
$0.06 \overline{54}=\frac{654-6}{9900}=\frac{648}{9900}=\frac{18}{275}$
Hence, option A is the correct answer.
107.If $\cot x=\frac{5}{12}$, then $\sin ^{2} x+1=$ ?
(A) ${ }^{\frac{194}{169}}$ (B) $\frac{216}{65}$
(C) ${ }^{\frac{331}{169}}$ (D) $\frac{313}{169}$
A. (A)
B. (D)
C. (B)
D. (C)

## Ans: B

## Sol:

$$
\begin{aligned}
& \cot x=\frac{B}{P}=\frac{5}{12} \\
& H=\sqrt{P^{2}+B^{2}}=\sqrt{169}=13 \\
& \sin x=\frac{P}{B}=\frac{12}{13} \\
& \sin ^{2} x+1=\left(\frac{12}{13}\right)^{2}+1=\frac{144+169}{169}=\frac{313}{169}
\end{aligned}
$$

108.If $\operatorname{Cot} x=\frac{5}{12}$, then $\sin x+\frac{1}{\cot x}+\sec x=$ ?
A. $173 / 13$
B. $77 / 13$
C. $75 / 13$
D. $17 / 13$

Ans: B
Sol:
If $\operatorname{Cot} x=\frac{5}{12}$
We know that, $\quad \cot x=\frac{\text { base }}{\text { perpendicular }}$
Base $=5 \mathrm{k}$
Perpendicular $=12 \mathrm{k}$
Hypotenuse $=\sqrt{(5 k)^{2}+(12 k)^{2}}=\sqrt{25 k^{2}+144 k^{2}}=\sqrt{169 k^{2}}=13 k$


$$
\begin{aligned}
& \Rightarrow \sin x+\frac{1}{\cot x}+\sec x \\
& \Rightarrow \\
& \frac{12}{13}+\frac{12}{5}+\frac{13}{5}=\frac{60+156+169}{65}=\frac{385}{65}=\frac{77}{13}
\end{aligned}
$$

109. When the angle of elevation is become $60^{\circ}$ to $30^{\circ}$ by the Sun, Then shadow of water increases 30 meter more. Find the height of tower.
(A) $12 \sqrt{3}$ metre
(B) $16 \sqrt{ } 3$ metre
(C) $17 \sqrt{ } 3$ metre
(D) $15 \sqrt{ } 3$ metre
A. (D)
B. (C)
C. (B)
D. (A)

Ans: A

## Sol:

Let the height be $h$.
A.T.Q.:
$\tan 60=\frac{h}{x}$
$\tan 30=\frac{h}{x+30}$
$x \tan 60=(x+30) \tan 30$
$x \sqrt{3}=\frac{x+30}{\sqrt{3}}$
$x=15$
Then, $\mathrm{h}=15 \sqrt{ } 3$.
110.The height of a light house is 20 meter from sea level. The elevation angle of ship is $30^{\circ}$ to the top of the light house. Find the distance of the ship from the bottom of the light house.
(A) 16 m (B) $20 . \sqrt{3} \mathrm{~m}$
(C) 20 m (D) 30 m
A. (A)
B. (D)
C. (C)
D. (B)

Ans: D

## Sol:


height of the lighthouse $=20 \mathrm{~m}$
Angle of elevation $=30^{\circ}$

$$
\begin{aligned}
& \tan 30^{\circ}=\mathrm{AB} / \mathrm{BC} \\
& 1 / \sqrt{ } 3=20 / \mathrm{BC} \\
& \mathrm{BC}=20 \sqrt{ } 3 \mathrm{~m}
\end{aligned}
$$

111.The angle of elevation of a ladder inclined to a wall is $60^{\circ}$. The bottom of the ladder is 8 metre away from the wall. Find the length of the ladder.
(A) 10 metre
(B) 13 metre
(C) 15 metre
(D) 16 metre
A. (A)
B. (B)
C. (D)
D. (C)

Ans: C
Sol:
Let the length of the ladder be x ,
then $\cos 60^{\circ}=8 / x=1 / 2$
$\mathrm{x}=16 \mathrm{~m}$
112.If $\sqrt{ } 3 \tan \theta=1$, then find the value of $\cos 2 \theta$.
(A) ${ }^{\frac{1}{2}}$
(B) $\frac{1}{\sqrt{3}}$
(C) ${ }^{\frac{1}{3}}$
(D) 1
A. (B)
B. (D)
C. (C)
D. (A)

Ans: D

## Sol:

$\sqrt{3} \tan \theta=1$
$\tan \theta=1 / \sqrt{3}$
$\theta=30^{0}$
$\cos 2 \theta=\cos \left(2 \times 30^{\circ}\right)=\cos 60^{\circ}=1 / 2$
113.If $\sin A=\frac{4}{5}$ and $\sin B \frac{5}{13}$, then $\cos (A+$ B) $=$ ?
(A) $\frac{16}{65}$
(B) $\frac{63}{65}$
(C) $\frac{33}{65}$
(D) ${ }^{\frac{56}{65}}$
A. (B)
B. (A)
C. (D)
D. (C)

## Ans: B

## Sol:

Given $\sin \mathrm{A}=4 / 5$ than $\cos \mathrm{A}=3 / 5$
And $\sin B=5 / 13$ than $\cos B=12 / 13$
$\operatorname{Cos}(\mathrm{A}+\mathrm{B})=\cos \mathrm{A} \cos \mathrm{B}-\sin \mathrm{A} \sin \mathrm{B}$
$=3 / 5 \times 12 / 13-4 / 5 \times 5 / 13=(36-20) / 65=$ 16/65
114. $\operatorname{cosec}^{2} \mathrm{~A} \times \cos ^{2} \mathrm{~A}=$ ?
(A) $\tan ^{2} \mathrm{~A}$
(B) $\cot ^{2} \mathrm{~A}$
(C) 1
(D) $\sec ^{2} \mathrm{~A}$
A. (A)
B. (D)
C. (C)
D. (B)

Ans: D

## Sol:

$\operatorname{cosec}^{2} A \times \cos ^{2} A=\frac{1}{\sin ^{2} A} \times \cos ^{2} A=\cot ^{2} A$
115.Distance between two straight poles of height 15 m and 20 m is 12 m . Find the distance between the top of two poles.
(A) 11 m
(B) 12 m
(C) 13 m
(D) 14 m
A. (A)
B. (C)
C. (D)
D. (B)

Ans: B
Sol:
$P Q=20 \mathrm{~m}$
$\mathrm{AB}=15 \mathrm{~m}$
$\mathrm{PR}=20-15=5 \mathrm{~m}$
Distance between top of poles AP $=\sqrt{ }\left(12^{2}\right.$ $+5^{2}$ ) $=13 \mathrm{~m}$

116.If $5 \tan \theta=4$, find the value of $(3 \sin \theta$ $-2 \cos \theta) \div(2 \sin \theta+3 \cos \theta)$
(A) $\frac{6}{23}$
(B) $\frac{2}{23}$
(C) $\frac{4}{23}$
(D) $\frac{5}{23}$
A. (D)
B. (B)
C. (C)
D. (A)

## Ans: B

## Sol:

Given, $\tan \theta=4 / 5$
In the above expression,
$(3 \sin \theta-2 \cos \theta) \div(2 \sin \theta+3 \cos \theta)$
On dividing both numerator and denominator by $\cos \theta$, we get
$(3 \tan \theta-2) /(2 \tan \theta+3)$
On putting the value of $\tan \theta$ in the above equation, we get
$[3 \times(4 / 5)-2] /[2 \times(4 / 5)+3]=2 / 23$
117.If $\sin \theta=2 / 3$, find the value of $\sec \theta$ and $\cot \theta$.
A. $\sqrt{5} / 2,2 / \sqrt{ } 5$
B. $2 / \sqrt{ } 5,3 / 5$
C. $(3 \sqrt{ } 5) / 5, \sqrt{5 / 2}$
D. $3 / 5,(3 \sqrt{ } 5) / 5$

Ans: C

Sol:


In right angle triangle ABC , by Pythagoras theorem
$B C=\sqrt{5} \mathrm{~cm}$

So, $\sec \theta=3 / \sqrt{5}$ or $(3 \sqrt{5}) / 5$
And $\cot \theta=\sqrt{ } 5 / 2$
$118 \cdot \sin ^{2} 21^{\circ}+\sin ^{2} 69^{\circ}$ is equal to
A. $2 \sin ^{2} 21^{\circ}$
B. $2 \sin ^{2} 69^{\circ}$
C. 1
D. 0

Ans: C
Sol: $\operatorname{Sin}^{2} 21^{\circ}+\sin ^{2}\left(90^{\circ}-21^{\circ}\right)=\sin ^{2} 21^{\circ}+$ $\cos ^{2} 21^{\circ}=1$ $\qquad$ $\left(\sin \left(90^{\circ}-x\right)=\sin x\right)$
119.The value of $\cos \left(1110^{\circ}\right)$ is:
A. $\sqrt{3} / 2$
B. $1 / 2$
C. $1 / \sqrt{ } 2$
D. 1

Ans: A
Sol: Given, $\cos \left(1110^{\circ}\right)$
$=\cos \left(3 \times 360^{\circ}+30^{\circ}\right)$
$=\cos 30^{\circ}$
$=\sqrt{ } 3 / 2$
120.If $\tan A=\frac{15}{8}$ and ${ }^{\tan B=\frac{7}{24}}$, then $\cos (\mathrm{A}+\mathrm{B})=$ ?
(A) $\frac{87}{425}$
(B) $\frac{304}{425}$
(C) $\frac{297}{425}$
(D) $\frac{416}{425}$
A. (A)
B. (C)
C. (B)
D. (D)

Ans: A

## Sol:

Tan $A=15 / 8$
Then,
$\operatorname{Sin} A=\frac{15}{\sqrt{15^{2}+8^{2}}}=\frac{15}{\sqrt{289}}=15 / 17$
$\operatorname{Cos} A=\frac{8}{\sqrt{15^{2}+8^{2}}}=\frac{8}{\sqrt{289}}=8 / 17$
Similarly, $\tan B=7 / 24$
Then, $\sin A=7 / 25$ and $\cos A=$ 24/25
$\operatorname{Cos}(A+B)=\cos A \cos B-\sin A$ $\sin B=(8 / 17) \times(24 / 25)-(15 / 17)$ x (7/25)
$=(192-105) / 425=87 / 425$

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